Crystal IS wins SBIRs for Epi-ready substrates and high efficiency LEDs.

(L to R) Dr. Keith Evans, Crystal IS VP Business Development, with Professor Shahedipour.
"We view our partnership with Crystal IS as an important component of our advanced compound semiconductor R&D roadmap. We are excited about taking an active role in the establishment of a center of excellence in epitaxial growth at our College for Nanotechnology, recently announced by Governor Pataki, to support New York State's high technology companies, as embodied by Crystal IS," says Professor Fatemeh Shahedipour

Crystal IS Inc, supplier of single-crystal aluminum nitride (AlN) substrates, has won two new Phase I Awards under DARPA's Small Business Innovative Research (SBIR) programme. Both programmes entail key subcontracts with Albany NanoTech of the University of Albany-State University of New York for R&D on its state-of-the-art III-nitride epitaxial growth facilities under the direction of Professor Fatemeh Shahedipour.

"We are very appreciative for the continuing support we have received from DARPA and other DoD agencies. Such support has been critical in helping us drive towards the commercialisation of native single crystal AlN substrate technology which has strong potential to positively impact on many high value electronic and opto-electronic device applications," says co-founder, president and CEO, Dr Leo Schowalter.

One of the new programmes is associated with efforts to develop 'epi-ready' substrate surfaces. This could speed the development of low cost high performance devices across a range of device types and applications. The other SBIR program is associated with a high-risk, high-pay-off technical approach based on combining the benefits of native AlN substrates with recently developed quantum dot technology.This would have the potential to enable the first high-efficiency deep-green LEDs, important for a variety of applications including solid state white lighting.

Precise focus

Smaller transistors have emerged thanks to closely focusing the light beams that etch into silicon. Chips contain millions of smaller transistors work faster because the switching electricity has less distance to travel.

It is assumed that light can be focused only as narrowly as about half its wavelength before light rays start to reinforce and cancel each other to make the light point fuzzy.

However, University of Erlangen Nürnberg have demonstrated it is possible to focus radially polarised ligh in an area around 40% smaller than the theoretical limit. The tight focus can be used to etch smaller circuits , improve microscope resoltion, and cram more on optical disks. Storage capacity of DVD could be increased by 150% without changing disc area or the wavelength of light used, according to the researchers. The tightly focused beams also contain an intense electromagnetic field at the point of focus that could be used to manipulate particles like atoms. Radially-focused light beams could be used practically in two years say researchers.

Albis 10 Gb/s ROSAs

Albis Optoelectronics AG, the privately held Swiss manufacturer of high speed, InP based optical components, is offering the PX625A, a 10 Gb/s receiver optical subassembly for 1270 - 1620 nm optical communications.

A six lead, high-sensitivity, low-cost coaxial module has differential ouputs and is very suited as a basic building block for short-to-long-reach SDH/SONET OC-192, 10G Ethernet and 10G Fiber Channel applications. Based on the industry standard TO-46 package, sub-assembly fits into all major form factors including XFP, X2, XPAK and XENPAK.

"The PX625A offers outstanding pin-TIA receiver performance with a record sensitivity of -20dBm and low power dissipation of only 130mW and used in harsh environments of operating temperatures up to 85ºC without any performance degradation.

"Compared with pigtailed special hybrids, our ROSAs enable a major cost breakthrough for high-end 10Gbs optical transport applications," says programme manager Daniel Lauchenauer.

Assembled inside a high frequency optimized TO-46 package, an InGaAs PIN photodiode manufactured in-house by Albis and a state-of-the-art silicon TIA, achieve a sensitivity of -20dBm, output voltage swing of 400 mVp-p and dynamic range of 20dB. With 3.3 V, operating voltage the subassembly has power dissipation of 130mW an industry record.Sampling of the PX625A in TO-CAN packages has begun with large volume quantities forecast as available May 2004.The ROSA version incorporating an LC receptacle is available to customer design and layout specs. In addition,Albis Optoelectronics offers a ready-to-use evaluation kit for easy assessment of module performance. Albis also has coaxial receiver subassemblies for 2.5 Gbs use.

"We are offering a wide range of services and are starting various R&D activities," said Joerg Wieland, co-founder and chairman of the board of directors.

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